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Copper Falls Mining Company

Annual Report of the Directors

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF PUBLIC INSTRUCTION

HARRISBURG

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THIRD
ANNUAL REPORT

OF THE
DIRECTORS

OF THE
Copper Falls Mining Company,

WITH THE
REPORT OF SAMUEL W. HILL,
SUPERINTENDENT OF THE MINE,
AND THE
CHARTER AND BY-LAWS OF THE COMPANY.

BOSTON:
PRINTED BY DAMRELL & MOORE, 16 DEVONSHIRE STREET.
1852.

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At the Annual Meeting of the Stockholders of the Copper Falls Mining Company, held April 5th, 1862, it was

Voted, That the Directors cause to be printed, for distribution among the Stockholders, such parts of the Annual Report, together with Mr. Hill's Report, and such other documents, as they may think proper.

In pursuance of the above vote, the Directors submit to the Stockholders, such parts of the Annual Report as are not embraced in that of Mr. Hill, together with the Report of Mr. Samuel W. Hill, Superintendent of the mine, and the Charter and By-Laws of the Company.

For the Directors.

JOHN T. HEARD. *President.*

REPORT.

THE Directors of the Copper Falls Mining Company submit to the Stockholders their third annual report, for the year ending April 1st, 1852.

As none of the previous reports of the Company have been printed, and as many of the present Stockholders have become such within the past year, the Directors deem it proper to give a brief review of the history of the Company.

The Copper Falls Company, to whose rights and property this Corporation succeeded, was formed October 16th, 1845, under articles of association, for the purpose of prosecuting mining operations on the lands embraced in Lease No. 9, granted by the War Department to Hon. David Henshaw. Some preparatory work was done by this Company in 1845, but active mining was not commenced till 1846.

This Association continued its mining operations till the fall of 1848, when its property was conveyed to this Corporation. The work was confined to one vein situated in Section 11, Township 58, Range 31. The vein was discovered in the bed of a stream, where it was exposed to view in the rocks at the Falls. Dr. Jackson in his Report on the Geology of Lake Superior, says of this vein: "At the head of the Falls the vein was six inches wide, and fifteen or twenty feet lower down, the width had

augmented to more than a foot, and in some places it was eighteen inches wide. At the bottom of the Falls, large lumps of copper, some half a pound in weight, were found, and on blasting into the vein, the copper was observed to increase in quantity, so as to prevent our obtaining any large masses of the vein stone, by the use of powder."

Without any preliminary examination in reference to the geological position of the rocks, mining was commenced near the point where the vein was discovered.

An adit level was driven, and four shafts were sunk. The appearance of the vein was such, as to encourage the most sanguine expectations of success on the part of the proprietors. In many parts the vein was exceedingly rich, carrying masses and barrel work. A mass of copper was found on the upper shaft of this mine, at a depth of about fifty feet from the surface, which weighed, when dressed, upwards of seven tons, and was then the largest mass that had been seen in the world; other masses of less weight were of frequent occurrence. Considerable silver was also found in the vein, connected with copper, and also mixed with a "greenish decomposed mineral," some of which, according to the Report of Dr. Jackson, contained from \$25 to \$100 worth of silver per hundred weight of the rock. There was a considerable quantity of this argentiferous rock found in certain parts of the mine. More than a ton of this rock was sent to J. B. Greene & Co., Paris, and there attracted much notice, but no returns have as yet been received from them, either as to the percentage of silver, or the amount for which it was sold.

Though the vein was quite irregular, in some places for several feet producing but little copper, and in others for an equal distance yielding rich mass and barrel copper, yet the Company felt encouraged to prosecute their mine vigorously, in the hope that as they obtained greater depth, the vein would prove more uniform in its character.

Up to the fall of 1848, this Association had expended \$59,534.10. Of this amount, \$3,475 was received from premium on stock—\$6,975 from a sale of 155 shares belonging to the Association, \$9,079.10 from sales of copper extracted from the mine, and \$40,005, from assessments on the stock. Of the sum expended, \$11,060.97 was paid for the purchase of Lease No. 9, from the Lake Superior Company.

The Association had an excellent road from Eagle Harbor to the mine, a distance of about two and a half miles—had constructed several houses and offices about the mine, and machinery for raising water, &c.

Four shafts had been sunk upon the vein; the most northerly shaft to the depth of 47 feet—the next 208 feet—the next 45 feet, and the most southerly 83 feet; an adit level had been driven 265 feet, and a winze sunk 66 feet below the adit level; these shafts had been connected by galleries at the usual distances. In the progress of the work, it had been ascertained that the mine was situated in a belt of trap-rock, of a vertical thickness of only 170 feet, a bed of sandstone overlying it on the south, 72 feet in thickness, and a bed of conglomerate underlying it on the north;—underlying the bed of sandstone on the south, was another bed of trap, but it was not known whether the vein in the upper trappean bed extended into the trap-rocks below. It was the impression of those, however, whose scientific reputation entitled their opinions to much confidence, that the vein would be found to exist in the trap formation beneath.

In March, 1848, the charter of this Company was granted by the Legislature of Michigan, and in the fall of the same year the Company was fully organized. This charter was obtained through the agency of the Copper Falls Association, and for its benefit, and for this reason, the persons named in the Act of Incorporation, constituted the Shareholders in the Copper Falls Company their associates under this Act, giving such Share-

holders as many votes in the organization of this Company, as they held shares in said Association. By vote of the Stockholders of this Company, the stock was directed to be issued to the Shareholders in said Association, share for share, upon payment of all dues to, and surrender of, their certificates of stock in said Association.

The Trustees of said Association, having been duly authorized and empowered in that behalf by the Shareholders, in consideration of the Acts of this Company which have been referred to, executed deeds, transferring to this Company all the property of said Association, of every name and nature whatsoever. The principal items of the property so transferred, were the Lease from the General Government, of Location No. 9, on Keweenaw Point, Lake Superior, with all the rights and privileges vested in said Association under the same, and the Act of Congress, usually called the "Mineral Land Bill," and personal property at the mine, consisting of provisions, materials, stock, buildings, and copper in the rock of too low a percentage to pay for removal. The property thus transferred, exclusive of the Lease, is estimated to have been worth at the time, about five thousand dollars.

When the Directors first assumed the management of the business of the Company in the fall of 1848, the Mining Agent was acting under instructions from the Trustees of the Copper Falls Company, authorizing him to employ as many men, not exceeding in all, however, the number of fifty, as could work to advantage. Having ascertained that by the shafts sunk and levels extended, a large amount of ground had been opened, and prepared for the extraction of its mineral contents, and that so far as could be judged from the appearances which the vein presented, when exposed by these shafts and galleries, the ground thus opened could be stoped (that is, the vein stuff removed) with profit—they thought proper to confirm the instructions given by the Trustees.

The Agent was further directed to sink the most southerly shaft through the sandstone underlying it. It was the opinion of most mining men, that the vein continued beneath the sandstone, and there were strong circumstances to support this opinion. Upon the decision of this question as to the continuance of the vein beyond the sandstone, depended chiefly its value.

In June, 1849, the process of stoping the vein having proved to be unprofitable, though a considerable quantity of copper had been raised, and enough having been done to make it clear that the ground which was opened could not be stoped with profit, it was determined to suspend mining upon that vein. The upper shaft had been carried down to the trap beneath the sandstone, and cross-cuts had been made east and west, about forty feet in each direction, but no vein of value had been found. The work which was done beneath the sandstone, however, should not be considered as affording conclusive proof that the vein does not exist in the underlying trap, the cross-cuts having been made so near the junction of the two formations, where the greatest disturbance would naturally be manifested. In order to arrive at a satisfactory conclusion upon this point, it would be necessary to try the ground at a lower depth. The position of the Company, at that time, was not such, as to justify the expense of such trial.

The Association had sunk a shaft upon another vein situated about a quarter of a mile east of the original vein, and the appearance was such, as to warrant the expectation that it would be productive. It was decided to drive an adit to this shaft, a distance of two hundred and fifty feet. This adit was driven through by the fall. A considerable portion of the adit was in dirt, and loose, decomposed rock—the last thirty feet of the distance, however, was in more compact rock, and here was of an average width of eighteen inches, and yielded considerable copper. On the completion of this adit, the Directors, acting upon the advice of men of much mining experience, decided to make a cross-cut from the shaft to a deep ravine about eighty

feet south-west of the shaft, at which point there were many indications of a strong vein.

On the first of June, 1850, the cross-cut having then been driven to the west side of the ravine above referred to, and nothing of any decided importance having been discovered, the Agent discharged his mining force, and suspended work.

At the time this last work was undertaken, it was supposed that the adit and cross-cut would be south of the sandstone belt, before referred to, but it proved to be north of it.

With the present mining experience on Lake Superior, a mine would not be commenced in a belt of trap of so little thickness as that in which all the works which have been described, were situated. It should be remembered, however, that these mining operations were among the earliest undertaken on Lake Superior; that they were begun at a time when there were but few inhabitants in the country, and but little navigation on the Lake, and in consequence, both labor and supplies were exorbitantly dear,—when all the disadvantages incident to the undertaking of an enterprise in a new country, had to be encountered,—and what is of more importance than all the rest, when hardly anything was known of the geology of the country.

The great error was in commencing a mine without a proper geological examination of the territory.

After the suspension of mining, a contract was made with Samuel W. Hill, Esq., who had recently been connected with the United States Geological Survey of the Lake Superior Mineral Region, and was eminently qualified for the work, to make a thorough exploration of the location held by the Company. Mr. Hill was able to examine only the east half of the location, when the fall of snow rendered further examinations impracticable.

(The results of this exploration are here given in the report as originally submitted, but as they are fully set forth in Mr. Hill's report, they are now omitted.)

Mr. Hill was so fully satisfied of the value of one of the veins discovered by this exploration, now known as the Copper Falls vein, situated about half a mile west of the old works, that he commenced mining it in November, with four men, without instructions from the Directors, feeling justified in taking this responsibility. This course was approved by the Directors, and a small force, not averaging more than six men, was employed during the winter. Mr. Hill was not resident at the mine, but visited it occasionally, and let the contracts, and supervised the work. Previous to last June, a shaft had been sunk upon this vein, to the depth of sixty-seven feet, and an adit driven about one hundred feet.

In June last, the Company engaged the services of Mr. Hill, as Superintendent of the mine. He immediately took charge of the work, and mining was actively commenced, and has been vigorously pursued to the present time.

(The statistics of the mining operations, which here follow in the original report, are now omitted, as they are more fully stated in Mr. Hill's report.)

Besides mining work, there have been built during the past season, fourteen houses, one smith's shop, a carpenter's shop, an office and a store-house—and thirty-four acres of land have been cleared and improved about the mine.

The whole number of men employed by the Company, at last dates, was 63, as follows, viz., 40 miners, 10 windlass men and wheelers, 2 smiths, 2 carpenters, 1 teamster, 1 surface man, 2 sawyers, 2 shingle makers, 1 clerk, 1 superintendent, 1 assistant superintendent.

In May last, the lands embraced in the Lease held by this Company, were entered in the name of the Company, at the Land Office, at Sault Ste Marie, Michigan. A patent has since issued for the same, and is now on record at the Recorder's Office, in Houghton County, where the lands are situated. The number of acres embraced in the patent, is four thousand two

hundred and sixty-one and $\frac{5}{100}$, more than one half of which is represented as mineral land, by the United States Geological Survey.

(A description of the lands owned by the Company is here given in the original report, but as they are fully described in Mr. Hill's report, it is now omitted.)

In July last, the Legislature of Michigan, on the petition of the Directors, passed an amendment to the charter of the Company, authorizing an increase of the number of shares of the Capital Stock to ten thousand.

At a meeting of the Stockholders, held on the 14th of August last, this amendment was accepted, and it was voted that the Capital Stock be divided into ten thousand shares, and that the same should be issued to the Shareholders of the Company, in the proportion of three and one-third shares, for every share then held by them, upon the surrender of their certificates. All the old stock has been changed in accordance with the above vote, and the whole number of shares is now issued.

The whole amount of money which has been received by the Treasurer, from all sources, since the organization of the Company, is \$78,965.96.

Of this amount, \$20,000 was derived from a sale of stock belonging to the Company, and was paid out as a dividend to the Stockholders ; — \$5,956.94 is the proceeds of sales of copper ; — \$6,805.02 has been received from miscellaneous sources ; — the remainder of the amount, \$46,204, has been received from assessments on the Capital Stock.

For a particular statement of receipts and expenditures for the past year, the Directors refer to the Treasurer's report herewith submitted. Deduct from the gross expenditure for the year, the sum of \$5,326.88 paid for the purchase of the location, and \$730 paid outstanding dividends, and the balance, viz., \$27,854.80, represents the regular expenses of the Company since work was commenced upon the present mines.

From the assurances given them by their Agent, than whom there is no one more competent to judge, as well as from their own knowledge of the richness of the mines, so far as they have been developed, the Directors entertain scarcely a doubt, that a vigorous prosecution of the enterprise will, at no distant day, result in handsome dividends to the Stockholders. How much further expenditure will be required, before the mines will reach the paying point, cannot be accurately estimated. An engine and stamp mill will be wanted during the ensuing season, and the mine must be further opened by shafts and connecting galleries, before any considerable amount of stoeping can be done. It must be remembered, too, that it requires some time before the product of the mine can be turned into money. The Agent will undoubtedly be able to ship a few tons of copper in the spring, and more in the fall ; but until stamping machinery is erected, only a portion of the proceeds of the mine can be brought to market.

As nearly as can be ascertained now, thirty or forty thousand dollars more will be required, to be called in assessments. It is therefore recommended to the Stockholders, to vest a discretionary power in the Directors, to call for further instalments of the capital stock, to an amount not exceeding three dollars per share in the whole, in such sums and at such times as to them may seem expedient.

JOHN T. HEARD,	}	<i>Directors of C. F. M. Co.</i>
JAMES DANA,		
PHILO S. SHELTON,		
JOSEPH W. WARD,		
SAMUEL W. HILL,		

Boston, April 5, 1852.

DR. HIRATIO BIGELOW, *Treasurer, in Account with* COPPER FALLS MINING COMPANY. CR.

1851. April 1.	To balance of cash on hand,..... " proceeds of copper,..... " " from assessments,..... \$174 28 30,652 00	\$5,913 79	1851. April.	By paid outstanding dividends,.... " " for Co. lands, " " Supplies, " " Labor, &c., at Mine, .. " " Interest,..... " " Insurance, " " Taxes, " " Postage, stationery, le- gal expenses, printing, .. and other charges,.... " " Treasurer's salary,	\$730 00 5,326 88 11,451 14 14,296 26 217 25 129 75 100 22 860 18 800 00
				1852. April 5.	" balance—cash on hand this day,	\$33,911 68 2,828 39
			\$36,740 07			\$36,740 07

1852.

April 5. To balance to new account,..... \$2,828 39

STATEMENT of the Assets and Liabilities of the COPPER FALLS MINING COMPANY, March 1, 1852.

ASSETS.		LIABILITIES.	
Cash in Treasurer's hands,	\$2,828 39	Amount due Miners, March 1st, estimated at	\$4,240 77
" " on hand at Mine,	380 79	Balance, being surplus of personal effects, as of this date,	9,252 85
Assessments due,			
Copper at Mine, valued at			
Inventory of supplies and materials on hand,			
	\$3,209 18		
	1,348 00		
	2,500 00		
	6,436 44		
	\$13,493 62		\$13,493 62

REPORT OF SAMUEL W. HILL,

SUPERINTENDENT OF THE MINE.

OFFICE COPPER FALLS MINE, MICHIGAN,

March 1st, 1852.

HORATIO BIGELOW, Esq., *Sec. of the C. F. M. Co.*

SIR : — In compliance with your request, I submit for your consideration the following Report, on the topography, geology, and exploration of the Copper Falls Mining location, situated immediately to the west and south-west of Eagle Harbor, and on the northern escarpment of the trap-pean ridge of Keweenaw Point, Lake Superior, Michigan. It embraces Sections eleven, twelve, thirteen, fourteen and fifteen, and fractional Sections One, Two, Three and Ten, in Township Fifty-eight, North of Range, Thirty-one west, and contains forty-two hundred and sixty-one and one-half acres. It is bounded on the north by the Lake, on the east, by the lands known as the Eagle Harbor location, on the south, by the Dana, Winthrop, and North Western Companies' grounds, and on the west, by the location known as the old Lake Superior Copper Company's. Along and near the Lake, and more particularly on the aqueous formation, its altitude does not exceed eighty feet, but near its southern boundary, it rises to the height of seven hundred feet above the Lake.

The entire location is covered with wood, a portion of which is well adapted to the timbering of mines, more especially on that part near the Lake ; while on the southern and that portion upon the igneous rock, may be seen excellent sugar maple, birch, oak, and white pine in

sufficient abundance for all purposes of fuel and lumber, which the Company may require during the ensuing fifty years.

Geologically considered, the location is very interesting. Along the Lake, from Eagle Harbor to the rocky point at the lower end of Sand Bay, is a bed of trap-rock, extending inland but a few hundred feet from the Lake. It rests on a mixed sand and conglomerate rock, having a dip to the north of 28° . It is overlaid by the same rock about seven hundred feet from the shore into the Lake. The whole thickness of this bed of trap does not exceed one thousand feet. To the south of this trap bed, is the mixed sand and conglomerate just mentioned, with a width horizontally of nearly one mile. The lowest strata of this rock have their out-cropping edges resting on the trap-rock to the south of them, to the height of from seventy-five to one hundred feet above the Lake; but between this and the Lake, it is seldom seen emerged above the surface, and rarely attains an elevation of more than twenty feet. It is in these lowest strata, and where they rest in the trap at a considerable elevation, that we may obtain a good and desirable material for the foundation of machinery, and for such purposes of building as is often required about mines.

To the south of this aqueous formation, there are no less than five alternations of sandstone and trap. The thickness of these beds varies considerably, none exceeding four hundred feet, while some may not be more than fifteen feet. The united thickness of all these beds does not vary much from twelve hundred feet. They have a very uniform dip of 30° to 32° to the north. To the south of these rocks, and underlying them, are the thicker beds of trap, without intervening bands of sandstone. These beds vary in thickness from five to fifteen hundred feet, and are found much more amygdaloidal in their upper portions than in the lower. When these beds are of great thickness, the lower portions are always compact and crystalline. Those beds of trap which alternate with the sandstone are highly amygdaloidal, and always more so in their upper portions than in their lower. Throughout the mineral district of the south shore of Lake Superior, the upper parts of the trap beds have always been found less crystalline than the lower, and when, as has been before remarked, they are of considerable thickness, as the one north of the Cliff and North West Mines, and to the south

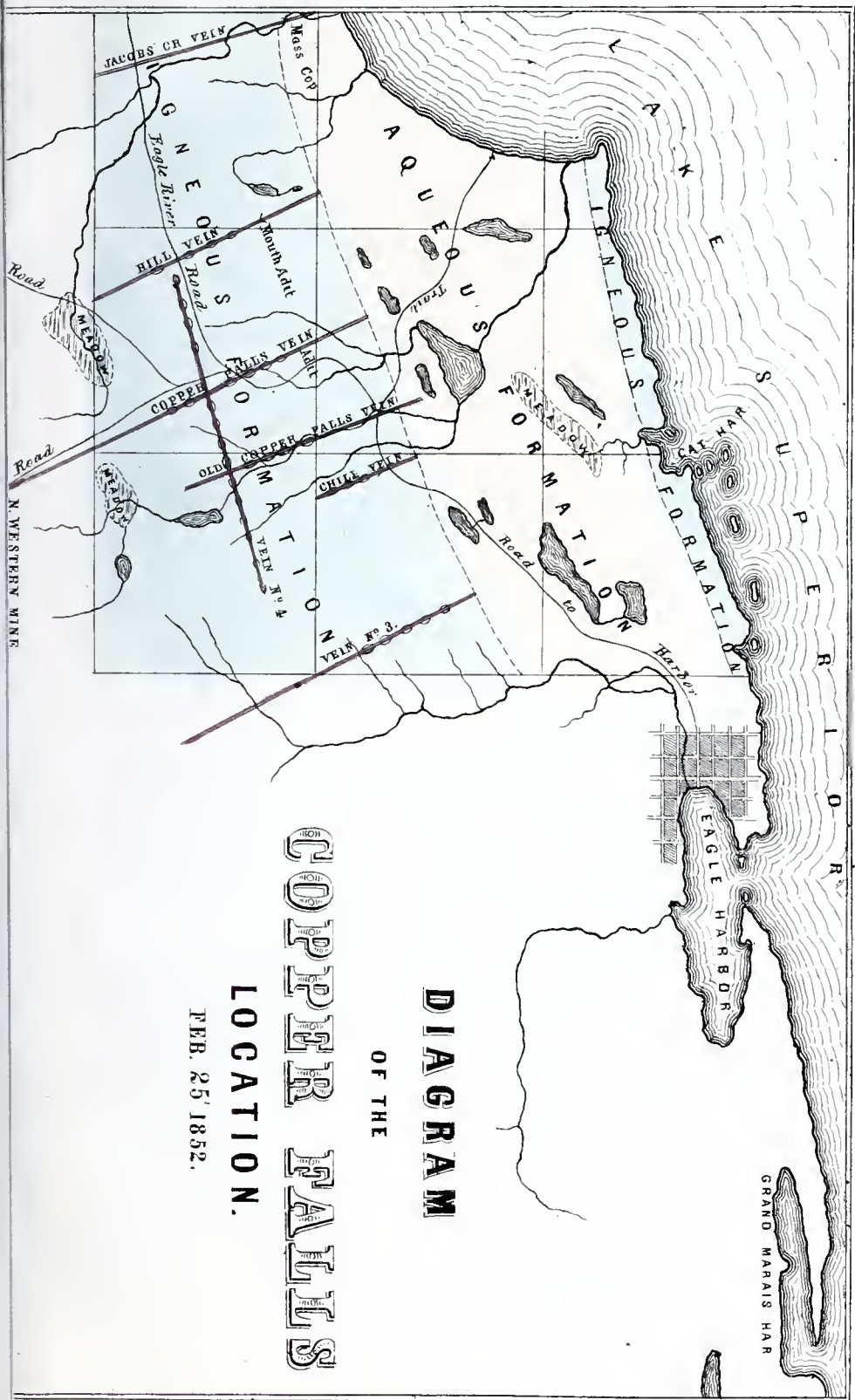


DIAGRAM OF THE COPPER FALLS LOCATION.

FEB. 25, 1852.

of this location, they are called greenstones, though by a careful examination, they have been found to graduate out into an amygdaloid structure in their upper portions, and to belong to one and the same bed of rock ; the differences of structure being the result of the differences of time required in the change from a fluid to that of a solid state, in the upper and lower parts of the same bed of lava, to which, perhaps, may be added the difference of pressure in the different parts of the beds.

It is in these beds of trap, to the south of those alternating with sandstone, that mining can be successfully carried on. The first mine work of the Company was in a bed of trap, between two beds of sandstone, of not more than four hundred and thirty-six feet horizontal thickness. The beds of sandstone were not found to be productive of much valuable metal, and were nearly two hundred feet thick. To excavate so much poor and unprofitable ground as was required to open an extensive mine, could only be attended with very great expense, and with doubtful results. The vein in the bed of trap was everywhere found to contain native copper in considerable masses, as well as finely disseminated through the vein rock, and near the upper part of the bed, silver was found in considerable quantities. To the east of this vein, and distant but a few hundred feet, is another, which, like the former, traverses the country, and in precisely the same geological position, in which work was carried on at about the same time. The working of that vein, must of necessity have been attended with the same fate as the former one. Neither of these veins was abandoned because they were not found productive in the rock they were worked in, but for the reason, that no considerable extent of opening in the rock could be made, without encountering the unproductive sandstone. In May, 1850, the Company ordered a detailed examination of its grounds, with reference to the discovery of other veins in more advantageous situations for working. In the mean time all mine work was suspended, until the results of that examination could be ascertained. That examination was commenced in September, in the same year. Its first efforts were directed to the veins in which work had been done.

To the south, across the beds of sandstone, into the underlying beds of trap, those veins were traced, and it was not until after the exami-

nation had reached a point in them, over one thousand feet from the old workings, that they were found of sufficient width and productiveness to justify working. This distance from the old works rendered it impossible to make use of the mine work already done, in working at the point where there seemed to be a probability of favorable results, without a very great expenditure ; and hence they were placed upon a parallel with any other veins which might be discovered on the other parts of the location. One of these veins may be seen in the Copper Falls Creek, above the bridge in the Old Road to Eagle River, where it widens to two feet. It was observed along the bed of the Creek and in the East Bank for many rods, and noticed to contain a fair percentage of native copper, but the steepness of the creek banks makes it difficult to mine without some surface preparations.

Soon after the examination of those veins which had been worked, the discovery of the Copper Falls vein, and veins numbered Three and Four, was made. The Jacob Creek vein was found in 1845, and the Hill vein in November, 1850. Vein No. 3 was discovered by Samuel Stevenson and George Taylor, two men who were employed on the examination. It has been opened along its back every one and two hundred feet from near the base of the trap ridge on the north, to the point where it crosses the line of the location, a distance of nearly three-fourths of a mile. Deep ancient pits and excavations were found to mark its bearing in a very striking manner. From many of the places opened in it, small pieces of pure copper were taken, some of fifteen or twenty pounds weight, and the vein rock contained fine copper disseminated through it. The vein has a width varying from a few inches to two and a half feet. Its average width, where seen, would not probably exceed eighteen to twenty inches. It is sufficiently rich in native copper, and such is its situation that it can be profitably mined.

Vein No. 4 is a lateral vein. It has the same bearing and dip as the adjacent rocks, and possesses all the characteristic phenomena of the Minnesota and many other veins in the Ontonagon district.

It was first noticed by some remarkably deep ancient pits and excavations, a few yards to the west of the place, where the Copper Falls Creek crosses it. These deep excavations, seventy feet wide and over thirty-seven feet in depth, were not, on their first discovery, easily recognized

as being artificial, so far did they exceed in dimensions any other works of the kind in the mineral district; but when the vein was traced to the east and west of these excavations, a continuous chain of others was found along its back for more than one mile. The enormous heaps of earth and rock which had been taken from the more extensive excavations, were found on examination to be unstratified, while in other and lesser pits, stone hammers and copper arrow heads were frequently met with. In the bottom of some of those pits, from which the earth, rotten wood and coals were removed, thin sheets of pure copper were noticed standing in the vein fissure, while in others, a wide deposit of foreign matter, such as calc spar and other vein minerals, with small bunches of copper, and fine copper disseminated through the rock, was noticed. To the west of one of these deep pits, this vein is traversed by one bearing nearly north and south, in which, near their junction, is considerable ancient mine work. It should here be remarked that this last mentioned vein has a shaft in it, about fifty rods to the north of the former vein, known as shaft No. 4 in the old works of the Company. It was sunk in 1846 to the depth of forty to fifty feet. The vein was found in that shaft to be eighteen inches wide, and well filled with fine copper. From the shaft to the junction of the two veins, this one runs in the bed of the creek, the descent of which is so moderate, that no very deep adit drainage can be had by following the vein, without considerable expense; and without a drainage of considerable depth, the lateral vein cannot advantageously be mined, for some of the deeper ancient pits have their bottoms below the creek bed. A drainage through any other avenue than that along the north and south vein, and up the bed of the creek, cannot well be effected without still greater expense than by following that vein. It may be safely stated that the expense of an adit along the vein in the Creek to the lateral one, will not exceed \$7,000.

To the west of this point the lateral vein will be reached in due time by the workings in the Copper Falls vein, now going forward, and at a depth of 300 feet below the surface. At this place the vein is not so wide as at the former, yet it is well filled with copper, and at the depth of 300 feet it can be profitably worked through the avenues along the vein. To the west of the Copper Falls

vein, the lateral vein becomes less distinct and more difficult of a surface examination, yet it may be seen at intervals along westerly, to near the line of the Hill vein, and may be found to traverse it.

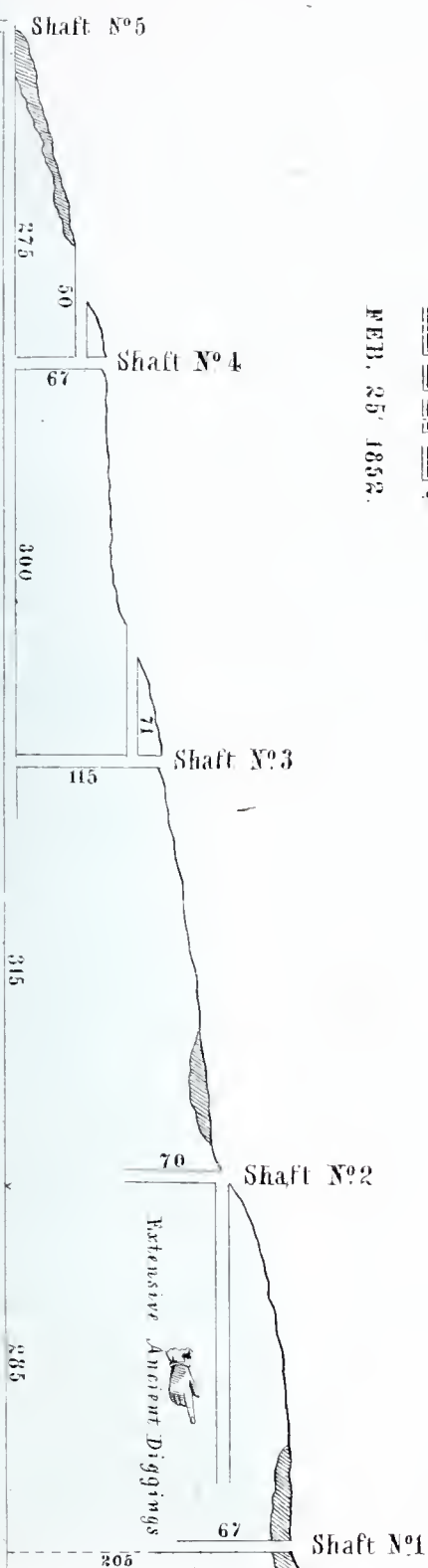
The Copper Falls vein, so called, because the principal mine works of the Company, at the present time, are in it, was discovered by following up a branch, or feeder, which led to the main vein. It bears S. 25° E., and underlies to the west at a moderate angle. It may be followed from near the base of the trap ridge on the north, almost uninterruptedly across it, to the North-Western mine. Along its back numerous openings were made, many of them in the ancient pits, and in almost every one of these openings, unmistakable evidences of its value could be seen. The situation of this vein for deep drainage, and the easy, speedy and cheap mode of conveying the excavated rock to the surface, gives it a decided preference over any other yet discovered in the mining district.

But little was done in the further examination of the location to the west of the Copper Falls vein, until September, 1851, when the Hill vein was opened in, along its back, from near the base of the ridge to the south line of the location. It is situated one half mile to the west of the Copper Falls vein, and in the same geological position. It has about the same bearing as that, and underlies to the west. It was found to have an almost continuous channel of ancient mine work along its back, which, at some points, has been found to extend to the depth of twenty feet in the rock. Wherever this vein has been opened, small masses of pure copper have been found, and in all of the vein rock, fine copper has been found thoroughly disseminated, and of a fair percentage. This vein, like the Copper Falls, possesses superior advantages for adit drainage, and for the removal of the dirt and copper to the surface. The Jacob Creek vein may be seen at the base of the trap ridge, in the bed of a creek by that name, not more than twenty-five to thirty feet above Lake Superior. In the second falls in the Creek, above the base of the ridge, and in the vein, is a sheet of pure copper a few feet in length, and one to two inches thick. At this place, the creek has excavated the wall rock, leaving the small mass standing in the vein below it. The copper is so much covered

LONGITUDINAL SECTION OF THE

COPPER FALLS MINE.

FEB. 25, 1882.



with water, that it would not easily be noticed by any one travelling up or down the stream. It has created some anxiety among the members of the Company desirous of learning its locality. It had been known to an Indian trapper for a period of twenty years, and is said to have been found by a miner in the employ of the Company, in 1846, but in both cases it was kept secret. The vein in which it has been found to exist, has been known to the Company since the summer of 1845.

It should here be stated, that no value can be attached to the discovery, beyond the sheet referred to, for it is only a few yards to the south of it, where the vein traverses two heavy beds of sandstone in which copper was not found. To the south of these beds of sandstone, and in the trap-rock along the bed of the creek, the vein may be seen frequently for one-fourth of a mile. In one place it was noticed to be nearly four feet wide, and contains mixed rock and fine copper, but no where along this whole length of the vein in the creek can it be profitably worked. The trap along the stream has been excavated by the water to the depth of 100 feet, and in width more than 400 feet, with nearly perpendicular walls on either side. To the south, and where the vein leaves the stream, it may be mined. The rock then becomes more firm, and lies more nearly in the metalliferous zone of the country.

Many other veins besides those mentioned in the foregoing remarks, were noticed during the process of the examination of the grounds, but they seemed of less importance, and have not been described. That some of them may in due time, and after a more extensive examination, be found worthy of the Company's attention, there is little reason to doubt.

In concluding these remarks, and before entering upon the description of the mines and mine works of the Company, it should be stated, that among the many locations in the mining district, no one possesses more valuable prospects for mining, and no one is so advantageously situated in all respects, as the Copper Falls location. It embraces an ample territory and includes several valuable discoveries, among which are some that can be mined at a far less expense than any others in the Lake Superior region, yet discovered.

The mine work of the Company was resumed in December, 1850,

when a small force was employed in the Copper Falls vein. The deep adit gallery in that vein was then commenced, and also No. 1 shaft, but it was not until June, 1851, that active operations were begun. During that summer, houses were erected for the accommodation of miners, smiths, carpenters and other men, whose work was principally about the mines. The old buildings were too distant from this vein to be made use of advantageously for this purpose. Roads were constructed from the old mine to the present one. Considerable ground was cleared of its timber, with a view to the raising of vegetables, hay and oats, another year. All this very necessary work, preparatory to mining vigorously, has cost rather high, as has been the case at all other mines in the country, and will be until some years hence, when the facilities for building and making surface improvements shall be greatly increased. The mine work has also been costly, more so than it is hoped it will be hereafter.

The upper gallery, which is now opening towards the bottom of shaft No. 1, has been a work of necessity rather than of choice. Along the back of the vein for many rods to the south of the shaft, the surface water concentrates and runs to the north. It finds its way into that shaft, 18 feet below the surface. No efficient drainage could be had without the use of that gallery, and none which could be made to answer without it. The sinking of shafts Nos. 3 and 4 has been required, to ventilate the gallery below. The gallery might have been opened during the winter months as far as shaft No. 3, without any ventilation from the surface, but it could not be worked during the summer months, nor could No. 3 shaft be sunk at that season. No. 5 shaft has been sunk seventy-five feet below the adit gallery, and the eleven fathom gallery commenced. This work was done with a view to test the value of the vein at that depth, and if found rich in copper, the surface machinery for hoisting rock and pumping the water, and also that for dressing the copper, would be influenced in its location.

At the bottom of that shaft, the vein was found to be 30 inches wide, and contained copper in small bunches and finely disseminated through the vein rock. Along the adit gallery, for the first 100 feet from the surface, the vein contained pieces of pure copper, and all the vein rock was found well filled with fine copper. To the south, along

the gallery of shaft No. 3, the vein contains but little copper. The rock is too much broken along this part of the vein, to expect any considerable deposit of copper. As soon as the gallery shall reach those more firm beds of rock to the south, and in which shaft No. 1 has been sunk, the vein will be found productive. The eleven fathom gallery, whenever opened to the south from No. 5 shaft, will show the vein to contain copper in sufficient abundance to work profitably. At that depth the rock will be found firmer, and hence better walls to the vein will be presented.

Shaft No. 2 was sunk on a branch of the main vein running to Shaft No. 1. When the shaft was commenced, and for 30 feet down from the surface, considerable copper was met with; below that point to the bottom of the shaft, but little copper was seen in the branch or feeder. This shaft is between the vein in the upper gallery and the one the lower works are in, and on a branch or feeder running from one to the other. From the bottom of the shaft, a cross-cut has been made to the west, and the main vein below crossed, which was found to be four feet wide, with but little copper. The vein there was filled with fragments of vein stone, thoroughly charged with fine copper. It is evident that the work is not deep enough in the rock, to expect a large amount of copper from the vein there, although to the north of this place the vein is fully four feet wide, and has pieces of pure copper, five to twenty-five pounds weight. A cross-cut is now being made to the east, from the bottom of the shaft, to the vein in which the upper gallery is opening, in which it is expected, when the vein shall be reached, copper in small masses will be found.

The upper gallery has been opening in a well defined vein, and one rich in copper, for more than one hundred feet in the south end. Considerable barrel work, that is, pieces of pure copper, is taken from that work almost daily. By the first of April, that gallery will reach the shaft. To the south of the shaft, the vein is known to be much richer than to the north of it. It is from this part of the work that copper will be taken, and sent to market the ensuing summer. From the surface to the bottom of shaft No. 1, the vein can be profitably stoped away; masses of from 400 to 500 pounds were taken from the shaft, when it was sinking. The adit gallery, it will be seen, will,

when carried up to a point under the shaft, be 205 feet below the surface, a depth which could not be gained by working from the surface at the shaft downwards, in a period less than three years, whereas that depth will be gained by the gallery, within one year from this date. The expediency of this plan of working must be apparent to all interested, for through the gallery the rock and copper can be carried to the surface on railways, at a far less expense than it could possibly be hoisted through shafts, while at the same time, and without rehandling the copper rock, it can be delivered into the stamping mill. To the south, from where the gallery will intercept No. 1 shaft, and about 500 feet from that shaft, vein No. 4 will be met with. Another advantage to be gained by this deep adit gallery, is the drainage of all water above it, which will be no inconsiderable quantity. Below it, but little water may be expected.

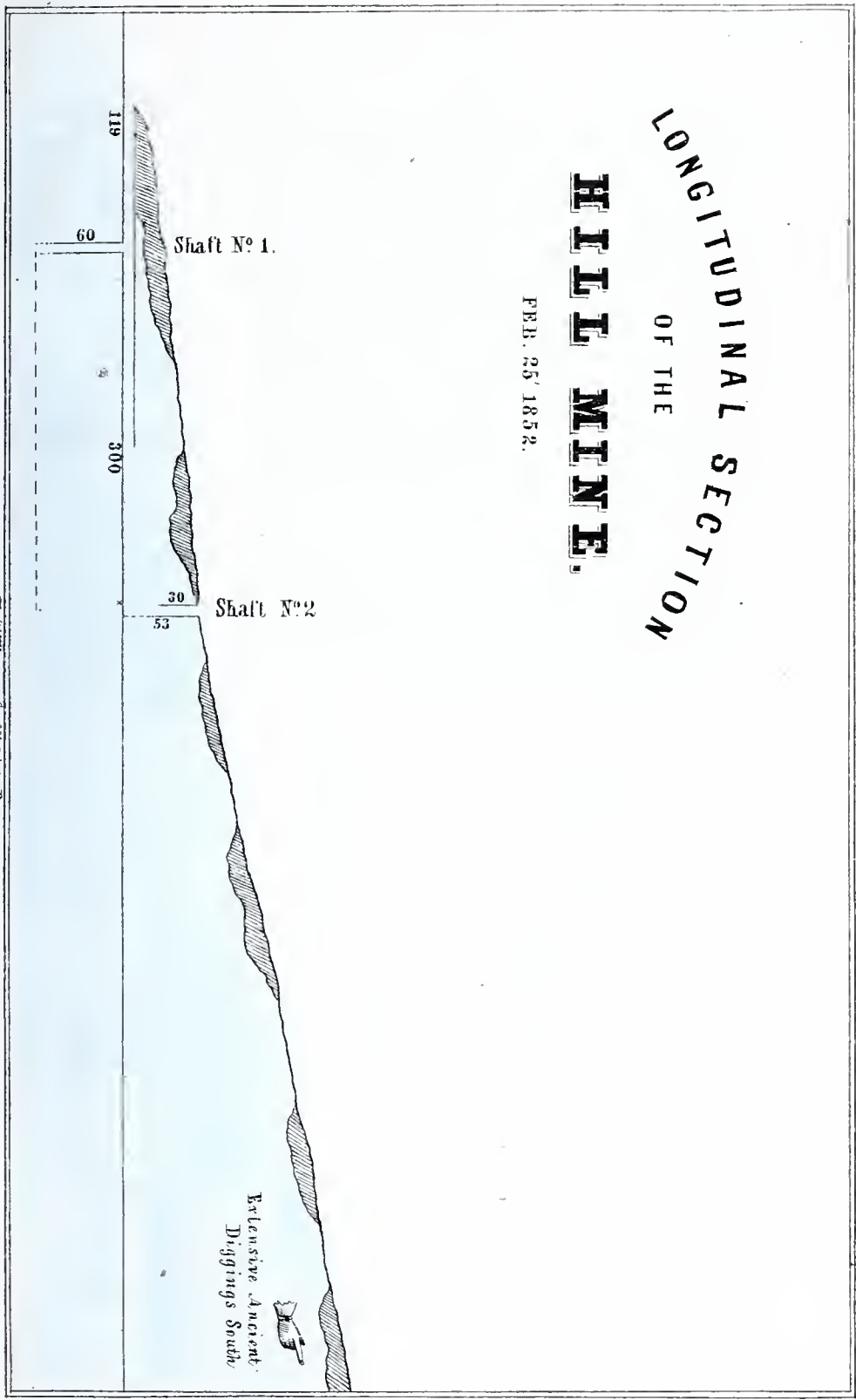
Work was commenced on the Hill Mine about the last of November, 1851, in a gallery twenty-five feet higher than the adit gallery in the Copper Falls vein. This position of the two adit galleries has been studied, with reference to the convenience of railways from them to a stamping mill, which is intended to be located between the two mines. Shaft No. 1 was commenced in that vein, and will be sunk seventy-five feet by about the first of April. The vein has been found varying in width, from one to five feet. It has yielded small pieces of pure copper of from one to fifty pounds, and a large amount of mixed vein rock and copper. Along the gallery to the south of this shaft, the vein has been found rich in copper. Shaft No. 2 was commenced on the first of February with a view to connect with, and ventilate the gallery, by the first of June next. Thus far in the sinking of that shaft the vein has been large and well filled with copper. Some small masses of copper have been met with to the present time. The results of working that shaft will be found of the most flattering kind.

The propriety of working two veins at one and the same time may be questioned by some interested in the Company, and in justification of the plan which has been adopted in disposing of the Company's force during the present winter, it may be stated, that mining is and has been considered a most uncertain enterprise—that a failure in any *one* vein

LONGITUDINAL SECTION OF THE

HILL MINE.

FEB. 25, 1852.



would so far prostrate the energy and ambition of the Company, as to make it almost, if not quite impossible for it, to commence in another one—that the prospects of a profitable yield from working the Hill Mine during the winter were of that character, which cannot fail to result favorably to the interest of the Company. No failure is anticipated in either of the veins now working, but it has been the case when the most sanguine expectations were entertained by persons, well qualified to investigate vein phenomena, that veins have proved, after a period of working, to be unprofitable. By the plan adopted, the Company is doubly guaranteed against the effects of the unprofitableness of either mine, and should one of them prove largely productive, all parties interested would be amply rewarded for the expenditure, which may be made in the two.

Below may be seen such statistical information as can be given from the Clerk's Office. It has been intended to give a full report from the Office, but for want of bills of purchase of supplies and bills of freight, together with some other necessary papers, a thorough statistical report cannot be made at the mine.

Amount of ground excavated in the	
Copper Falls vein, by drifting,	966 feet.
“ shafting,	345 “
“ stopeing,	8 fathoms.
Hill vein, by sinking,	84 feet.
“ drifting,	277 “
<hr/>	
In all 1,672 feet, 8 fathoms.	
At a cost of	\$11,740 37
Surface expenses,	6,184 50
<hr/>	
*\$17,924 87	

* This sum does not embrace the whole expenditure incurred in the mining operations of the Company. There were various items not accessible to Mr. Hill. The entire cost of the mining business, including every payment made by the Company since work was commenced upon the present mines, except the amount paid for the purchase of lands, is, as stated in the Directors' Report.

ASSETS OF THE COMPANY.

Inventory of provisions, materials, and effects on hand, .	\$6,436 44
Expenditures made for tramroads, buildings, and common roads,	2,231 00
Old buildings of the Company,	730 00
	<hr/>
	\$9,397 44

The above statement includes statistics up to this time.

The mine work, or ground opened, has not cost as much as at most of the other mines in the country. It is believed it may be carried forward from this time at a less cost than before.

Copper on hand, in small masses and barrel work, and in vein rock, may be fairly estimated at twelve tons.

In conclusion, permit me to allude to the commendable zeal and fidelity which has been exhibited by Mr. Cox, as Assistant Superintendent, and Mr. Simpkins, as the Clerk, in aiding to conduct the mine, and other work of the Company. The long residence of Mr. Cox in the country, and his acquaintance with the department of labor to be performed about mines, have made him a valuable man for the position which he holds. The experience of Mr. Simpkins as a book-keeper, and his acquaintance with financial business, render him a valuable officer in his department.

I am, Sir,

Very respectfully,

Your obedient servant,

SAMUEL W. HILL.

CHARTER.

AN ACT

To Incorporate the "Copper Falls Mining Company."

SECTION 1. Be it enacted by the Senate and House of Representatives of the State of Michigan,—That George L. Ward, William Ward, and Charles Henshaw, and others who shall become associated with them, are hereby constituted a body corporate, by the name of the Copper Falls Mining Company, for the purpose of mining, smelting, and manufacturing ores, minerals and metals, in the Upper Peninsula of the State of Michigan.

SECTION 2. The said Company shall have corporate succession, and its capital stock shall be three hundred thousand dollars, divided into shares of one hundred dollars each; and said Company may acquire and hold such real and personal estate in the Upper Peninsula of Michigan, as the business of said Company may require, to an amount not exceeding the capital stock of said Company.

SECTION 3. The officers of said Company shall consist of a President, a Board of five Directors, including the President, who shall be one thereof, a Secretary and Treasurer, who may, however, at the pleasure of the Company, be one and the same person; and the said Company may levy assessments on the shares of its stock, and forfeit and sell the same, for non-payment of any such assessment, in such manner as said Company by its By-Laws may prescribe. *Provided*, that one of the said Directors shall, at all times, be a citizen and resident of the State of Michigan, upon whom service of all process

against said Company may be made ; and such service shall be deemed a valid service, as against the said Copper Falls Mining Company.

SECTION 4. The said Company shall pay to the Treasurer of the State of Michigan an annual tax, at the rate of one per cent. on the whole amount of capital actually paid in upon the capital stock of said Company, and also upon all sums of money borrowed by said Company, which tax shall be paid on the first day of July in each year, and shall be estimated upon the last preceding report of said Company ; and for that purpose, the President and Secretary of said Company shall, on the first day of January in each year, or within fifteen days previous thereto, make, under their hands, a return to the State Treasurer, verified by their several oaths, stating the amount which has actually been paid in on the capital stock of said Company, and also the whole amount of money which at any time has been borrowed by said Company ; and said State tax shall be in lieu of all other taxes upon all the personal property of said Company, and in lieu of all State tax upon the real estate of said Company ; and any investment of any portion of the net profits of said Company in the business of said Company, shall be considered as so much capital paid in, and returned to the State Treasurer accordingly.

SECTION 5. The Legislature may at any time alter, amend, or repeal this Act for any violation of the provisions of this charter.

SECTION 6. The first meeting of said Company shall be held at such time and place as the persons named in the first section, or a majority of them, shall appoint, by a notice to be published in one or more newspapers in the city of Detroit, at least thirty days before the time of such meeting.

SECTION 7. Said Company shall be subject to the provisions of Chapter fifty-five—Title ten—of the Revised Statutes of Anno Domini eighteen hundred and forty-six, so far as the same are applicable and not inconsistent with the provisions of this Act.

SECTION 8. The inhabitants of this State shall have a lien upon the stock, appurtenances and entire property of said Company, for all claims and demands, not exceeding one hundred dollars each, against said Company, originally contracted or incurred within this State,

which shall take precedence of all other claims or demands, judgments or decrees, liens or mortgages against said Company.

SECTION 9. The said Company shall, within six months after the first election of the officers thereof, by a vote of the Board of Directors, locate a business office of said Company, within the territorial limits of the State of Michigan, and file in the office of the Secretary of State a certificate, specifying the place of such location, and all annual and other meetings of said Company, shall be held at such place, as the By-Laws of the Company may designate and direct.

SECTION 10. This Act shall take effect from and after its passage, and shall continue for thirty years from such passage. *Provided*, that nothing herein contained, shall be construed to authorize said Company to use, or exercise any banking power, or banking privileges whatever.

Signed, A. W. BUEL,
Speaker of the House of Representatives.

Signed, WILLIAM M. FENTON,
President of the Senate.

Approved March 15, 1848.

STATE OF MICHIGAN. ss.

I do hereby certify, that the annexed and foregoing is a true and correct copy of an Act, entitled, "An Act to incorporate the Copper Falls Mining Company," approved March 15, 1848, now on file in my office.

In witness whereof, I have hereunto set my hand, and affixed the great seal of the State of Michigan, this fifteenth day of March, A. D. 1848.

Signed, GEORGE W. PECK,
Secretary of State.



AN ACT

To amend sections "two" and "three" of, and supplementary to an Act, entitled "An Act to incorporate the Copper Falls Mining Company," approved March 15th, 1848.

SECTION 1. The people of the State of Michigan enact, that Section "two" of an Act, entitled "An Act to incorporate the Copper Falls Mining Company," approved March 15th, 1848, be, and the same hereby is amended, by striking out in the third line thereof the words "one hundred," and substituting the word "thirty,"—so that said section shall read :—

"SECTION 2. The said Company shall have corporate succession ; its capital stock shall be three hundred thousand dollars, divided into shares of thirty dollars each, and said Company may acquire and hold such real and personal estate in the Upper Peninsula of Michigan, as shall be necessary for the exercise of its corporate franchises."

SECTION 2. That section "three" of the Act to which this Act is amendatory, be, and the same hereby is amended, so as to read :—

"SECTION 3. The officers of said Company shall consist of a President, a Board of five Directors, including the President, who shall be one thereof,—a Secretary and Treasurer, who may, however, at the pleasure of the Company, be one and the same person ;—and the said Company may levy assessments on the shares of its stock, and forfeit and sell the same, for non-payment of any such assessments, in such manner as said Company by its By-Laws may prescribe. *Provided*, that one of the Directors shall at all times be a resident and citizen of the State of Michigan, upon whom service of all process against such Company may be made ; and such service shall be deemed a valid service as against the Copper Falls Mining Company. And *provided further*, that said Company shall at all times be subject to such general laws as are now in force, or may hereafter be passed, in reference to the commencement and prosecution of suits, and the service of legal process against corporations."

SECTION 3. The said Company shall not be entitled to any of the benefits or provisions of this Act, unless, within six months after its pas-

sage, the said Company shall cause a certificate of its acceptance of the provisions of this Act, signed by its President and Secretary, or a majority of its Directors, to be filed in the office of the Secretary of State.

Approved June 28, 1851.

I hereby certify the within, to be a true copy of an original Act, now on file and of record, in the office of the Secretary of State.

In testimony whereof, I have hereunto set my hand, and affixed the great seal of the State of Michigan, at Lansing, this twenty-second day of July, 1851.



Signed, R. R. GIBSON,
Deputy Secretary of State.

BY-LAWS.

ARTICLE I.

The Annual Meeting shall be held on the first Monday of April in each year, at such time and place as the Directors may appoint.

ARTICLE II.

Notice of all meetings of the Corporation shall be given by the Directors, by publication in some daily newspaper in Boston, for the space of two weeks.

ARTICLE III.

At all Meetings of the Corporation, each share shall be entitled to a vote, and absent members may vote by proxy;—and at all meetings of the Company, one fourth of the whole number of shares of the Company shall constitute a quorum for the transaction of business.

ARTICLE IV.

The Offices of Secretary and Treasurer shall be held by the same person.

ARTICLE V.

The Officers of the Company shall be chosen at the Annual Meeting by ballot, for the ensuing year; any vacancy occurring in the Board of Directors, may be filled by a majority of the votes of the remaining Directors, and if a vacancy shall occur in the Office of Secretary and Treasurer, it shall be filled by a majority of the votes of the Board of Directors. The Board of Directors shall, at their first meeting, choose one of their number President of the Company.

ARTICLE VI.

The Directors shall hold monthly meetings. The President may call special meetings of the Board, by giving notice thereof to his co-Directors, excepting only the Director resident in Michigan. The Directors may call special meetings of the Stockholders at such times and places, as they shall deem the interests of the Company to require. And the Directors shall call meetings of the Stockholders, whenever so requested in writing to do, by the holders of one-sixth of the Capital Stock of the Company.

ARTICLE VII.

The Directors shall be authorized to direct the operations of the Company, to manage its affairs in such manner as they shall deem best, and they shall have power to do any acts, which the Company might do at any legal meeting thereof, except so far as they may be restricted by any provisions in the By-Laws. It shall be the duty of the Secretary and Treasurer to keep a record of all the proceedings of the Corporation. He shall have the care of all Books and papers relating thereto, and he shall notify all meetings of the Corporation, and he shall conduct the correspondence of the Corporation. He shall collect and disburse all moneys, under such restrictions as the Directors may impose, and he shall give a bond satisfactory to the Directors, for the faithful performance of his duties. And the Secretary of the Company shall also be Secretary of the Board of Directors.

ARTICLE VIII.

Certificates of Stock shall be signed by the President and Treasurer, and shall be in such form, as the Directors may prescribe; but they shall be transferable only on the books of the Company.

ARTICLE IX.

The President and Directors shall receive no compensation for their services. The compensation of the Secretary and Treasurer shall be determined by the Board of Directors.

ARTICLE X.

The Directors may call for such instalments of the Capital Stock of the Company, as the Stockholders may, from time to time, vote. They shall give thirty days' notice of the time of payment of any instalment, by publication, at least three times a week, in some daily newspaper, printed in the city of Boston.

ARTICLE XI.

The Directors may forfeit the shares of such Stockholders as fail to pay, when due, any instalments levied thereon ; and after twenty days' notice of forfeiture, given in some newspaper published in Boston, the Directors may sell at public auction such forfeited shares, and shall pay to such delinquent Stockholders, or to their assigns, any surplus which may remain from the proceeds of such sale, after payment of the instalment due, together with the interest thereon, and the charges and expenses of such publication and sale.

ARTICLE XII.

No assessment shall be voted by the Stockholders at any meeting, unless notice thereof is given in the call for such meeting, which shall be published, not less than three times a week, for three successive weeks, in some daily newspaper printed in the city of Boston.

ARTICLE XIII.

These By-Laws, or any part of them, may be altered, amended or repealed by a vote of a majority in interest of the Stockholders.

Vanipinet
Binder
Gaylord Bros., Inc.
Makers
Syracuse, N. Y.
PAT. JAN 21, 1908

